Emission Calculation Fact Sheet

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PETROLEUM BULK PLANTS AND TERMINALS

This document lists Source Classification Codes (SCC) and emission factors for various activities at petroleum bulk plants and terminals. Petroleum bulk plants are defined as having throughputs of less than 5,000,000 gallons of petroleum a year, whereas, petroleum terminals have throughputs of 5,000,000 gallons or more a year. These factors are provided as an aid in calculating emissions. The emission factors were obtained from The Factor Information Retrieval (FIRE) Data System, Versions 6.23 or 6.24, the Environmental Protection Agency's (EPA) *Compilation of Air Pollutant Emission Factors (AP-42),* as well as the EPA's *Protocol for Equipment Leak Emission Estimates*, and the National Emission Standards for Gasoline Distribution Facilities (40 CFR 63, Subpart R). All these documents can be accessed on the Internet at: **www.epa.gov/ttn/chief/**.

It is not required that facilities use these listed factors to quantify their emissions. If a facility disagrees with any emission factor in this document, it may use other emission factors or another method of calculating emissions if the emission factor or method correctly identifies the processes at the facility and the resulting emissions. A facility doing so must provide information and documentation showing the source of the factors or method used and justification for their use. For example, site specific emission calculations provide more accurate emission estimates than the use of general emission factors.

Control Factors
The listed emission factors are for uncontrolled emissions. If a facility has control equipment, the emissions can be multiplied by the control factor. Calculate the control factor by subtracting the percent control efficiency from 100 and then divide that number by 100. For example, if the control efficiency is 87%, the control factor would be (100 - 87)/100 = 0.13. Control efficiencies may be listed on the equipment or in the equipment documentation. Alternatively, equipment suppliers can provide control efficiency values.

Scientific notation
The emission factors are expressed in scientific notation, which means that the decimal point has been moved. If the exponent is negative, move the decimal point to the left. If the exponent is positive, move the decimal point to the right. If the exponent is zero, the decimal point does not move. For example, if a number is expressed as 2.0E-1, move the decimal point one place to the left to get 0.20. If a number is expressed as 2.0E2, move the decimal point 2 places to the right to get 200. If a number is expressed as 2.0E0, the decimal point does not move – the number is 2.0. If a number is expressed as E3, the number is 1,000.

STORAGE

TANKS Software: It is recommended that facilities use the U.S. Environmental Protection Agency's (EPA) TANKS Software to estimate emissions from their storage tanks. This software uses chemical, meteorological, roof fitting, and rim seal data to generate emissions estimates for several types of storage tanks and is based on the emission estimation procedures from Chapter 7 of EPA's "Compilation of Air Pollutant Emissions Factors (AP-42)". TANKS can be accessed from the EPA's CHIEF Internet web site at **www.epa.gov/ttn/chief/software/tanks/index.html**. It is important to note that TANKS only calculates emissions related to a facility's storage tanks. It does not account for pollutants that may be emitted during material loading and unloading; or emitted from leaking seals, valves, flanges, or other fittings. To estimate emissions from these sources, you may use the emission factors provided in the tables below or the calculations provided in AP-42.

Emission Factors: Sources may also use the emission factors found in SCC 4-04-001-01 to 4-04-001-99 or SCC 4-04-002-01 to 4-04-002-79 to calculate VOC emissions from storage tanks.

LOADING / UNLOADING

SCC	DESCRIPTION	POLLUTANT	EMISSION FACTORS
4-04-002-50	Loading Racks	VOC	4.8E0 LB/ E3 GAL GASOLINE
4-06-001-01	Gasoline: Splash Loading	VOC	1.24E1 LB/ E3 GAL GASOLINE
4-06-001-26	Gasoline: Submerged Loading	VOC	4.1E0 LB/ E3 GAL GASOLINE

LOADING / UNLOADING *(continued)*

SCC	DESCRIPTION	POLLUTANT	EMISSION FACTORS
4-06-001-30	Distillate Oil: Submerged Loading	VOC	4.8E-1 LB/ E3 GAL DISTILLATE
4-06-001-31	Gasoline: Submerged Loading (normal service)	VOC	5.0E0 LB/ E3 GAL GASOLINE
4-06-001-32	Crude Oil: Submerged Loading (normal service)	VOC	2.0E0 LB/ E3 GAL CRUDE OIL
4-06-001-33	Jet Naphtha: Submerged Loading (normal service)	VOC	1.5E0 LB/ E3 GAL JET NAPHTHA
4-06-001-34	Kerosene: Submerged Loading (normal service)	VOC	1.6E-1 LB/ E3 GAL KEROSENE
4-06-001-35	Distillate Oil: Submerged Loading (normal service)	VOC	1.4E-2 LB/ E3 GAL DISTILLATE
4-06-001-36	Gasoline: Splash Loading (normal service)	VOC	1.2E1 LB/ E3 GAL GASOLINE
4-06-001-37	Crude Oil: Splash Loading (normal service)	VOC	5.5E0 LB/ E3 GAL CRUDE OIL
4-06-001-38	Jet Naphtha: Splash Loading (normal service)	VOC	4.0E0 LB/ E3 GAL JET NAPHTHA
4-06-001-39	Kerosene: Splash Loading (normal service)	VOC	4.0E-2 LB/ E3 GAL KEROSENE
4-06-001-40	Distillate Oil: Splash Loading (normal service)	VOC	3.0E-2 LB/ E3 GAL DISTILLATE
4-06-001-42	Crude Oil: Submerged Loading (balanced service)	VOC	3.0E0 LB/ E3 GAL CRUDE OIL
4-06-001-43	Jet Naphtha: Submerged Loading (balanced service)	VOC	2.5E0 LB/ E3 GAL JET NAPHTHA
4-06-001-44	Gasoline: Splash Loading (balanced service)	VOC	8.0E0 LB/ E3 GAL GASOLINE
4-06-001-45	Crude Oil: Splash Loading (balanced service)	VOC	3.0E0 LB/ E3 GAL CRUDE OIL
4-06-001-46	Jet Naphtha: Splash Loading (balanced service)	VOC	2.5E0 LB/ E3 GAL JET NAPHTHA
4-06-001-47	Gasoline: Submerged Loading (clean tanks)	VOC	4.0E0 LB/ E3 GAL GASOLINE
4-06-001-48	Crude Oil: Submerged Loading (clean tanks)	VOC	1.7E0 LB/ E3 GAL CRUDE OIL
4-06-001-49	Jet Naphtha: Submerged Loading (clean tanks)	VOC	1.5E0 LB/ E3 GAL JET NAPHTHA
4-06-001-60	Kerosene: Submerged Loading (clean tanks)	VOC	1.7E-2 LB/ E3 GAL KEROSENE
4-06-001-61	Distillate Oil: Submerged Loading (clean tanks)	VOC	1.3E-2 LB/ E3 GAL DISTILLATE

FUGITIVE EMISSIONS: MARKETING TERMINALS – Only major sources* need to report fugitive emissions in MAERS. (The emission factors below were derived from Table 2-3 of the EPA's Protocol for Equipment Leak Emission Estimates, which can be accessed on the Internet at **www.epa.gov/ttn/chief/ap42/ch05**).

SCC	DESCRIPTION	POLLUTANT	EMISSION FACTORS**
4-06-888-01	Truck Loading	VOC	1.085E-1 LB/E3 GAL GASOLINE
4-06-888-02	Valves	VOC	8.33E-1 LB/EACH-YR VALVE
4-06-888-03	Pump Seals	VOC	1.046E1 LB/EACH-YR DEVICE
4-06-888-04	Fittings (Connectors and Flanges)	VOC	1.55E-1 LB/EACH-YR DEVICE
4-06-888-05	Others***	VOC	2.52E0 LB/EACH-YR DEVICE

* Major source means any stationary source subject to the Title V, Renewable Operating Permit (ROP) Program. A major source has the potential to emit 10 tons per year or more of any one hazardous air pollutant (HAP), 25 tons per year or more of any combination of hazardous air pollutants, or 100 tons per year of any other regulated air contaminant (e.g. criteria pollutants).

** These emission factors are for total organic compound emission rates (including non-VOCs such as methane and ethane).

*** The "other" equipment type should be applied for any equipment type other than fittings, pumps, or valves.

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